

Its priorities are reflected in the dollars provided for individual R&D sectors, and this process ensures a continual 'rebalancing of the national research portfolio' to reflect future needs—not past expenditure patterns. Some continuity is inherent in the methodology, because sectoral funding strategies are on a five-year rolling basis.

- There has been an organisational restructuring of those who supply the science. DSIR is no more. A series of Crown research institutes has been erected in its stead; and it will be their individual responsibilities to remain viable. (This restructuring is more significant in the NZ context than would be the case here, because universities and industry provide proportionately only half as much research as in Australia. One of Government's aims is to use its funding to leverage-up the low level of business investment.)

The reform process continues. Over the next five years, an effort will be made to:

- Get the long-term strategic framework right. It is the intention to develop a 15-year planning horizon supplemented by 5-year priority statements. There will be no change in the 5-year funding limit.
- Evaluate investments. Different areas of policy interest will need to be allocated different levels of funding; and different evaluation methods will need to be developed to assess the economic/social/environmental outcomes of past funding initiatives.
- Shift the focus to the demand side. Less emphasis will be given to science policy and more to technology policy.

The Minister cannot direct the placement of funds—only enunciate priorities. All Government funding is distributed through contracts with the Foundation for Research, Science and Technology; and these contracts are for a maximum of five years—although longer-term horizons can be enunciated. Basic research has survived, despite fears at the outset.

Clearly, the reinvention of government in New Zealand (accountability/labour and finance reform/corporatisation/privatisation) has led to the reinvention of the science funding system.

The problem in Australia is the lack of a strategic view for science. Without that, we cannot have a science policy. Some see Australia's pluralistic Federal/State system as not requiring a policy for science. But all countries need answers to the questions: Why invest?/In what?/What is the required outcome?

There are those thinking about the topic here. The Industry Commission has canvassed the concept of contestable funding for CSIRO—although is that feasible if research funding for others is not contestable?

The Senate has attacked CSIRO for moving funding between topic areas; but the Senate sees funding 'in terms of the pork-barrel, not science priorities'. Federally, policy ideas tend to originate outside Government *per se*, largely in CSIRO. At the State level, research is handled within the bureaucracy—but science in general is a 'basket case' in the State system.

Returning now to New Zealand, the benefits flowing from the new ways of handling science policy and allocating research funds are several:

- Government confidence in science has been restored;
- sustained growth in science funding is assured—probably for 15 years;
- science has been able to escape history and embrace the future; and
- imperatives for user uptake and investment have been created. (There must be a commitment from the private sector in an area for it to attract increased funding.)

Finally, the lessons of the new way are:

- direct and comprehensive funding means that bad science, and that without priority, has nowhere to hide;
- Government thinks better when it is a strategic investor and shareholder;
- treasury-driven simple-mindedness is avoided; and
- selective investment helps to avoid short-termism and 'safe science'.

PROFESSOR MICHAEL PITMAN OBE FAA

SCIENCE POLICY: LOOKING FORWARD

Summary

Science policy is not static but needs to evolve as the context for using science changes and as different issues need to be addressed. The past year has been marked by a number of studies or consultations such as the IC Report, the ASTEC foresight study, CSIRO's futures papers and the lead up to the Innovation Statement due later this year. These consultations have collected a range of views on current policy and how it might develop.

ASTEC has had a major study in progress on Foresight or *Matching Science and Technology to Future Needs*. This study has suggested scenarios in 2010 as imaginary—but possible futures in order to ask when developments might take place in science and technology and what issues might become most important.

The study is conducting a series of 'Partnerships' in a number of areas such as the information and communications industry, shipping, urban water supply and health. ASTEC is also seeking the views of youth. It is also conducting round-table discussions on key issues. One took place on 24 May in Sydney on the science system of the future.

ASTEC's scenario for 2010 challenged the discussion by proposing that by this time the use of Internet and communications technology had produced many changes in learning. Universities were internationally open and students could shop around for courses. It was suggested that research had also become more international and multi-disciplinary using Internet; CSIRO had become an international agency (a proposition that attracted some interest from the press); industry carried out more R&D but Government support for R&D had stayed about the same in real terms as now, making funding more competitive and linked more tightly to the Governments needs, such as the environment.

New technologies and discovery in medicine had responded to the search for prevention rather than cure. There are, of course, other futures.

The aim of these discussions is not to predict the future but to use optional futures to challenge the extent that the present system can adapt to trends that can already be detected, such as the role of information technology, the emergence of APEC and importance given to environmental values.

My aim today is to challenge thinking about science policy—both policy for science and science for policy by emphasising that policy—or strategy—needs to take the context of the future into account.

MR PETER J. LAVER FTS

AN INDUSTRY EVALUATION OF AUSTRALIAN SCIENCE POLICY

The place of Science Policy

- Science Policy is *not* an end in itself.

- Science Policy is not research policy—it involves 'buying' new technology as well as 'making' or producing it domestically.
- Science is a component of virtually all government policies:
 - industry;
 - trade;
 - agriculture;
 - health/medical;
 - defence;
 - environment; and
 - social.
- Need to determine where science fits in each.
- Answer is different in each case so a generic 'Science Policy' is not necessarily relevant.

Science Policy—what it is not/should not be

- A focus on inputs
 - Dollars do not equate to quality or effectiveness.
 - Business expenditure should be dictated by industry structure and business plans, not international comparisons (as useful as a policy on garden tools, street cleaning or sporting attendance).
- Balancing public and private outlays
 - Private outlay on science is a business decision based on competing investment opportunities.
 - Public expenditure is a political decision based on competing priorities and the inertia inherent in an existing establishment.
- Picking winners/setting priorities
 - Criteria to be used by those not the users of outcomes are unclear.
 - Business may be stupid or short-sighted but in the end it lives with the consequences.
 - Government has role to consult and co-ordinate public interest science.
- Creating jobs—for scientists, tax specialists, lawyers, accountants, snake-oil salesmen
 - Any policy measure intentionally or unintentionally having a primary impact of this nature should be abandoned.

Science Policy—what it should be

- Creating awareness/interest
 - Community fear or apathy makes political support for science difficult.
 - Attitudes significantly influenced by the school education system.
 - Science lacks the inherent potential for popular acclaim/rewards of other fields of endeavour.
- Reducing risk/leveraging returns
 - Investments of any type are rarely simply 'go'/'